



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
QUANTITY SURVEYING N6
(2050026)

23 April 2021 (X-paper)
09:00–13:00

REQUIREMENTS: Dimension paper (OE 8/12)
Abstract paper (OE 8/10)
Billing paper (OE 8/11)

Calculators and an unmarked copy of the Standard System of Measuring Building Work may be used.

This question paper consists of 4 pages and 6 addenda.

315Q1A2123

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA
NATIONAL CERTIFICATE
QUANTITY SURVEYING N6
TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
 2. Read all the questions carefully.
 3. Number the answers according to the numbering system used in this question paper.
 4. Answer QUESTION 1 in the ANSWER BOOK.
 5. Answer QUESTIONS 2, 3 and 4 on the sheets provided.
 6. Number all loose sheets correctly and place it in sequence inside the ANSWER BOOK.
 7. Start each question on a new page.
 8. Sketches must be large, neat and fully labelled.
 9. Use only a black or blue pen.
 10. Strictly apply the rules and methods as stipulated in the Standard System of Measuring Building Work.
 11. Write neatly and legibly.
-

QUESTION 1

Consult the Standard System of Measuring Building Work and write both the unit and the categories of the way in which each of the following must be measured:

- | | | | | |
|-----|--|-----------------------------|---|-------------|
| 1.1 | 1.1.1 | Working space | | |
| | 1.1.2 | Plastering in narrow widths | | |
| | 1.1.3 | Trees |  | |
| | 1.1.4 | Risk of collapse | | |
| | 1.1.5 | Drilling of auger piles | | |
| | | | (5 × 2) | (10) |
| 1.2 | Explain the working principle of a retention fund. | | | (10) |
| 1.3 | Name FIVE items or sections that must be adjusted for the final account. | | | (5) |
| | | | | [25] |

QUESTION 2

ADDENDUM A (attached) shows the plan view of a hip and gable end roof construction. ADDENDUM B (attached) shows a detail of a full truss with information about all the jack trusses as well as a detail of the hip rafter and relevant information.

Specifications:



- 114 × 38 mm sawn South African pine timber
- 114 × 38 mm timber wall plate
- 10 mm Ø steel bolt and nuts
- Steel timber connectors
- Smooth timber rafter ends
- Treat timber wall plate before fixing

Measure all the work for this roof strictly according to the list given below. Additional work measured will be ignored.

- | | | | |
|-----|-----------------|---|-------------|
| 2.1 | Wall plate | | (2) |
| 2.2 | Full trusses | | (7) |
| 2.3 | Half-full truss |  | (6) |
| 2.4 | Jack trusses | | (6) |
| 2.5 | Hip rafter | | (4) |
| | | | [25] |

QUESTION 3

ADDENDUM C (attached) shows a section and a table of augured reinforced concrete piles with an under-reaming bottom.

Specifications:



- Earthworks:
- Drilling in stable ground
 - 30 MPa concrete

The following list must be calculated:

- Establishment
- Setting up
- Reinforcement
- Testing
- Augured drilling
- Under-reaming for enlarged feet
- Concrete in piles
- Concrete bulbs

[25]

QUESTION 4

ADDENDUM D (attached) shows a vertical section through the wall of a basement. ADDENDA E and F (attached) shows the measurements of the basement. The external dimensions are 15,000 m long and 11,500 m wide.

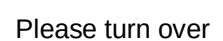
Remove ADDENDA E and F (attached) from the question paper. Write your EXAMINATION NUMBER in the space provided at the top right-hand corner of each page and hand it in with your ANSWER BOOK.

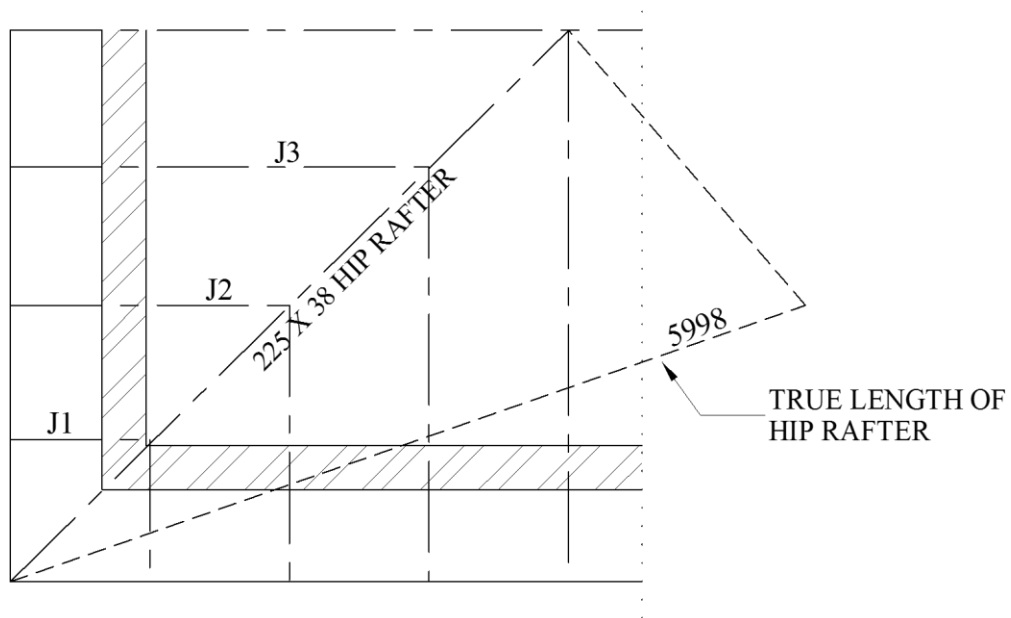
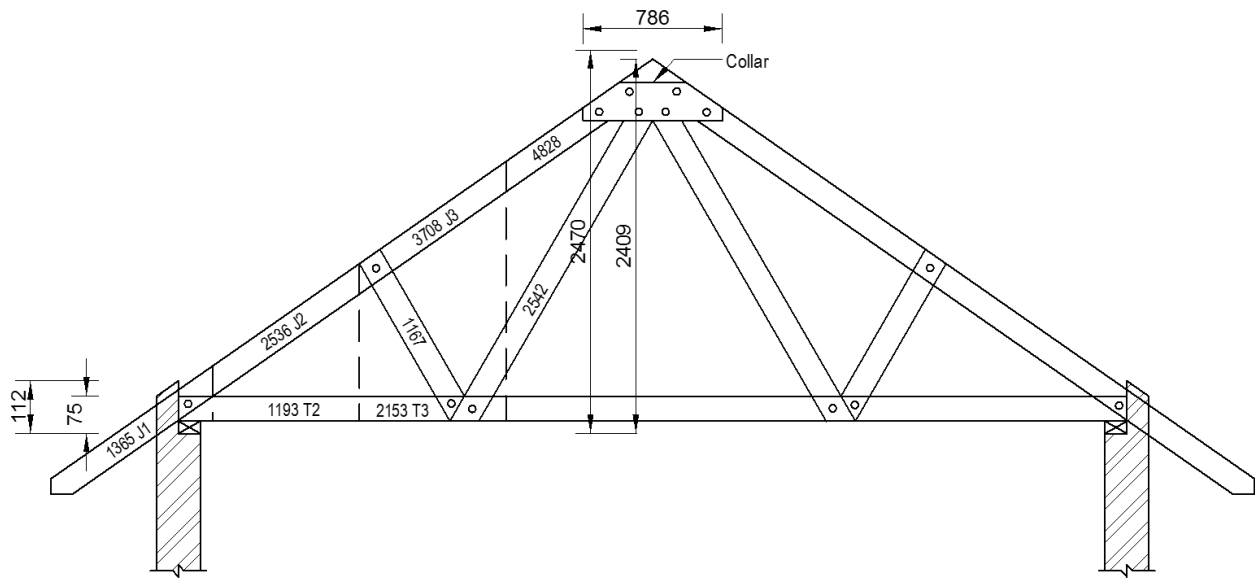
- 4.1 Square all earthwork items on ADDENDUM F.  (8)
- 4.2 Abstract all earthwork items from ADDENDUM F. (8)
- 4.3 Bill all earthwork items. (9)

[25]

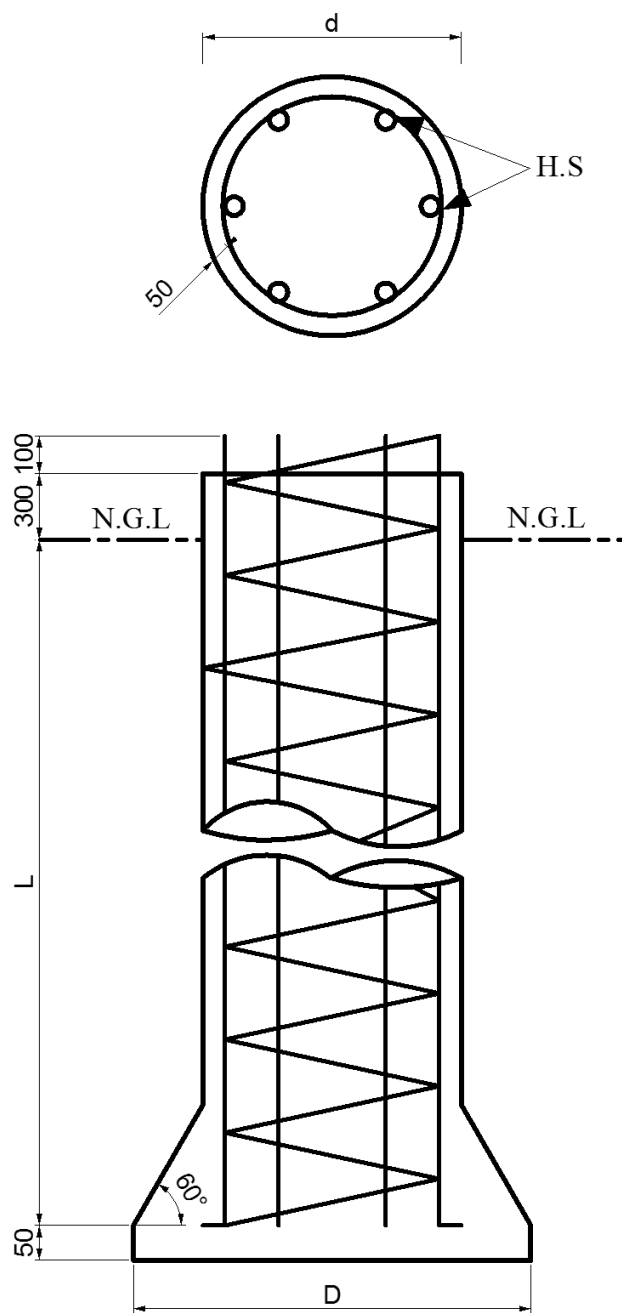
TOTAL: 100

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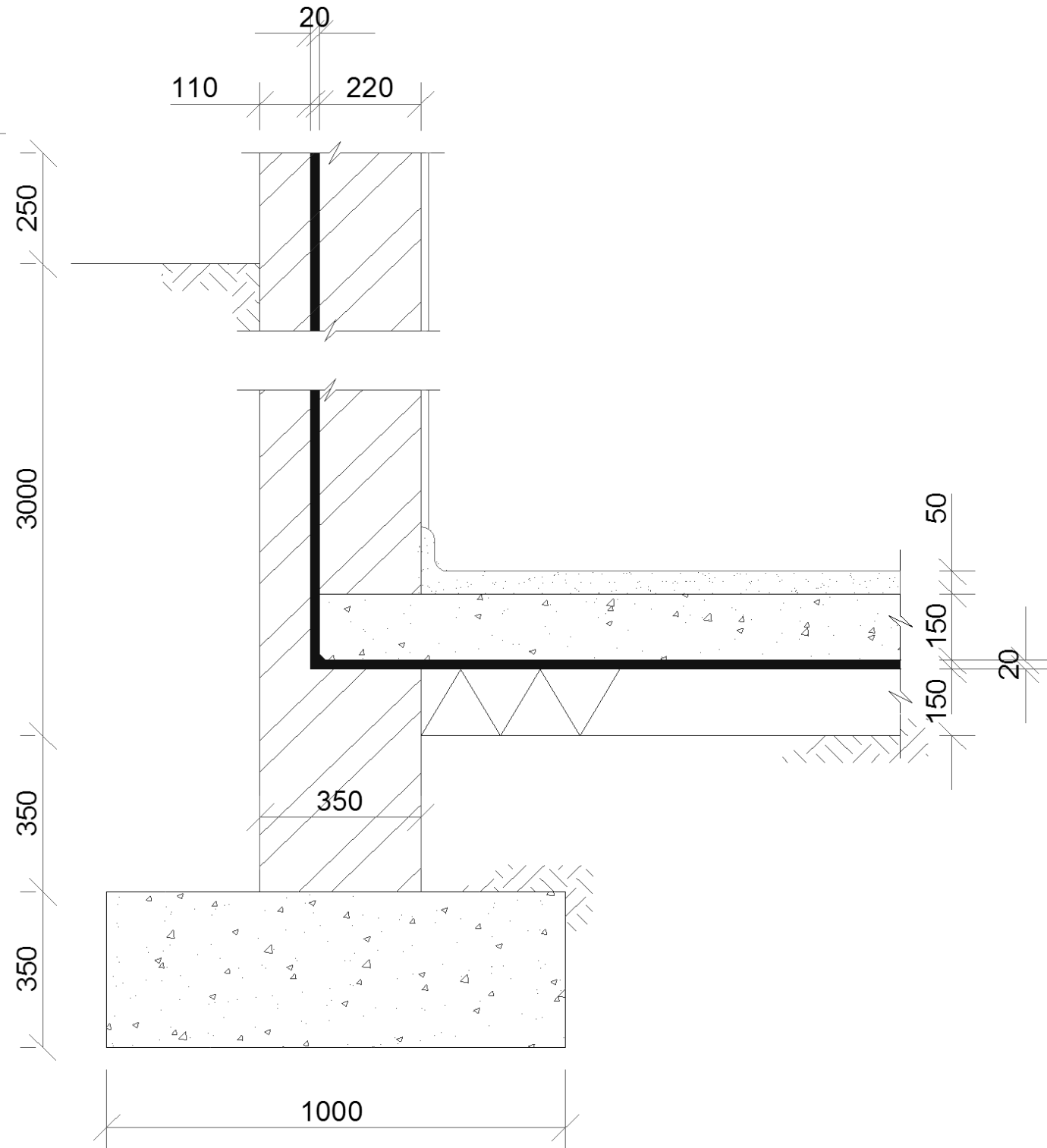
ADDENDUM BDETAIL OF HIP RAFTERSECTION THROUGH
ROOF CONSTRUCTION

ADDENDUM C



Pile reference	Total	d	D	L	Ø	Length
A	3	400	750	18,50	12	22,00
B	7	650	850	20,50	16	18,50
C	9	400	750	24,00	12	23,00
D	6	650	850	18,50	16	21,00

ADDENDUM D



ADDENDUM E

EXAMINATION NUMBER:

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	19,00 15,50		C.s. & prep. site for bldrs. wrk.	53,00 0,50		Exc. back from bsmnt. wl. for w.s. n.e 500m dp.
			$1000 - 350 = 650 \div 2$ $= 0,325 m$			
			$15,000 \times 11,500$ $+2/2m \quad 4,000 \quad 4,000$ $19,000 \times 15,500$	53,00 1,00		Ditto, but exc. 500 mm n.e. 1,5m dp from g.l.
			Excav. in ord. earth for bsmnt. Hole n.e. 2m dp.	~~53,00~~ 1,50		Ditto, but exc. 1,5m n.e. 3 m dp.
	15,65 12,15 2,00		$15,000 \times 11,500$ $+2/325 \quad 0,650 \quad 0,650$ $15,650 \quad 12,150$			$3,000 - 1,500 = 1,500 m$
			Ditto, but exc. 2m n.e 4m dp.	53,00 3,70		R.o.c to sides of bsmnt. Hole exc. 1,5 m dp. from g.l.
	15,65 12,15 1,35		$3,000 + 350 = 3,350 - 2,000$ $= 1,350 m$			$3.000 + 2/0,350 = 3,700 m$
			Excav. for bsmnt. trench exce.2m n.e. 4m from g.l.	45,00 0,70		Ditto, but to int. sides of bsmnt. trench exc. 1,5 m dp. from g.l.
	49,00 1,00 0,30		$2/15,000 = 30,000$ $2/11,500 = 23,000$ $53,000$ Less $4/1,000 \quad 4,000$ $49,000 m$	Item		$49,000 - 4/1,000 = 45,000 m$
						Keep excav. free of water.
				49,00 1,00 0,35		25 MPa mass conc. in bsmnt. ftg.
		(1)			(2)	

ADDENDUM F

EXAMINATION NUMBER:

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	49,00 0,50	350 mm Thk. bk.bsmnt. wl. $0,350 + 0,150 = 0,500 \text{ m}$	14,65 11,15 0,15		H.c. in bsmnt flr. $\begin{array}{r} 15,000 \times 11,500 \\ - \quad 0,350 \quad 0,350 \\ \hline 14,650 \times 11,150 \text{m} \end{array}$
	52,56 3,10	110mm Thk. bsmnt. Skin wl. $3,000 + 0,250 - 0,150 =$ <u>3,100m</u> $53,000$ $-4/0,110 = \quad \underline{0,440}$ <u>52,560 m</u>	14,78 11,28 0,15		25 MPa mass conc. in bsmnt. flr. incl. s.o.c. hor. top surf. $\begin{array}{r} 15,000 \times 11,500 \\ -2/110 \quad 0,220 \quad 0,220 \\ \hline 14,780 \times 11,280 \end{array}$
	51,82 2,93	220 mm Thk. bk. bsmnt. wl. $3,100 - (0,150 + 0,020)$ <u>=2,930 m</u> $52,560 - 4(55+20+110)$ <u>=51,820 m</u>	14,78 11,28		20mm Thk. hor. mastic asphalt. Length= $15,000 - 2/0,110$ <u>= 14,780m</u> Width = $11,500 - 2/0,110$ <u>=11,280m</u>
	54,30 0,33 3,35	Ext. b/fl. To sides of bsmnt. wl. $2/15,650 = 31,300$ $2/12,150 = \underline{24,300}$ $55,600$ $4/0,325 \quad \underline{1,300}$ <u>54,300 m</u> $3,000 + 0,350 = \underline{3,350 m}$	52,04 3,05		Ditto, but vert. $2/14,780 = 29,560$ $2/11,280 = \underline{22,560}$ $52,120$ $-4/0,020 \quad \underline{0,080}$ <u>52,040 m</u>
	43,70 0,33 0,35	Int. b.fl. to sides of 250 mm thk. bk. wl. $45,000 - 4/325 = \underline{43,700m}$	2 / 14,78 2 / 11,28		Extra for triangular mastic asphalt fillet.
		(3)			(4)